

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 September 2004 (30.09.2004)

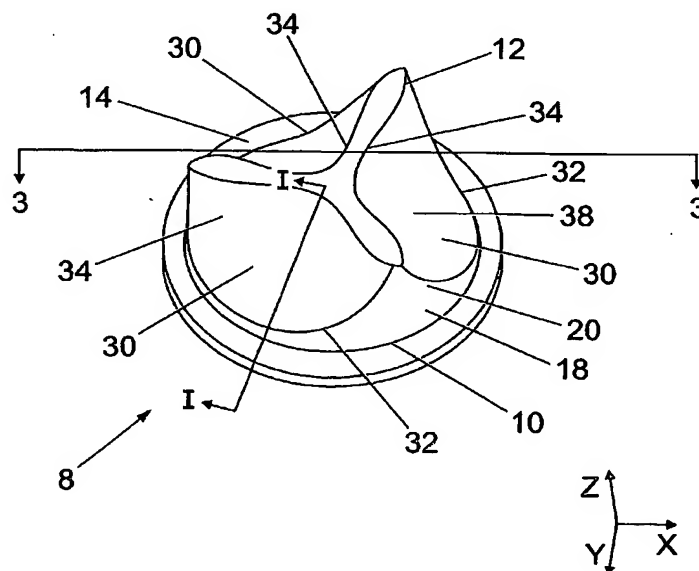
PCT

(10) International Publication Number
WO 2004/082536 A1

- (51) International Patent Classification⁷: **A61F 2/24**
- (21) International Application Number: **PCT/GB2004/001244**
- (22) International Filing Date: 22 March 2004 (22.03.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0306472.2 20 March 2003 (20.03.2003) GB
0319321.6 16 August 2003 (16.08.2003) GB
- (71) Applicant (for all designated States except US):
AORTECH INTERNATIONAL PLC [GB/GB];
Phoenix Crescent, Strathclyde Business Park, Bellshill,
Lanarkshire ML4 3NJ (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **BEITH, Jason, Gordon** [GB/US]; 25880 Astor Way, Lake Forest, CA 92630 (US).
- (74) Agent: **MURGITROYD & COMPANY**; Scotland House, 165-169 Scotland Street, Glasgow G5 8PL (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: VALVE



(57) Abstract: There is provided an artificial cardiac or heart valve (8), more particularly a flexible leaflet heart valve used to replace natural aortic or pulmonary valves of the heart in which the leaflet (30) geometry is defined by a parabolic function and a method of manufacturing said artificial cardiac valves. In addition, there is provided leaflets which have geometry defined by a parabolic function.

WO 2004/082536 A1

WO 2004/082536 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
.../GB2004/001244

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F2/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/41679 A (AORTECH EUROP LTD ;WHEATLEY DAVID JOHN (GB); HAWORTH W S (GB); BER) 14 June 2001 (2001-06-14) cited in the application the whole document	1-15
A	WO 02/100301 A (AORTECH EUROP LTD) 19 December 2002 (2002-12-19) cited in the application the whole document	1-14
A	WO 99/66863 A (SULZER CARBOMEDICS INC) 29 December 1999 (1999-12-29) the whole document	1-8
P,X	US 6 613 086 B1 (MOE RIYAD E ET AL) 2 September 2003 (2003-09-02) column 5, line 54 - line 61; figure 18	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

30 June 2004

Date of mailing of the international search report

08/07/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel: (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Newman, B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/001244

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 16, 17
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB2004 /001244

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 16, 17

There are no technical features in claims 16 and 17.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

International Application No

GB2004/001244

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0141679	A	14-06-2001	AU 2189401 A	18-06-2001
			CA 2393216 A1	14-06-2001
			EP 1235537 A1	04-09-2002
			WO 0141679 A1	14-06-2001
			JP 2003516182 T	13-05-2003
			US 2003097175 A1	22-05-2003
WO 02100301	A	19-12-2002	CA 2450600 A1	19-12-2002
			EP 1395205 A1	10-03-2004
			WO 02100301 A1	19-12-2002
			US 2003097175 A1	22-05-2003
WO 9966863	A	29-12-1999	CA 2305730 A1	29-12-1999
			EP 1089676 A2	11-04-2001
			JP 2002518131 T	25-06-2002
			WO 9966863 A2	29-12-1999
			US 6613086 B1	02-09-2003
US 6613086	B1	02-09-2003	CA 2305730 A1	29-12-1999
			EP 1089676 A2	11-04-2001
			JP 2002518131 T	25-06-2002
			WO 9966863 A2	29-12-1999